



FORESTRY PLANNING & DEVELOPMENT PROJECT  
Government of Pakistan-USAID

INSECTS AND DISEASES OF POPLARS



TECHNICAL NOTE NO. 13

June 1993

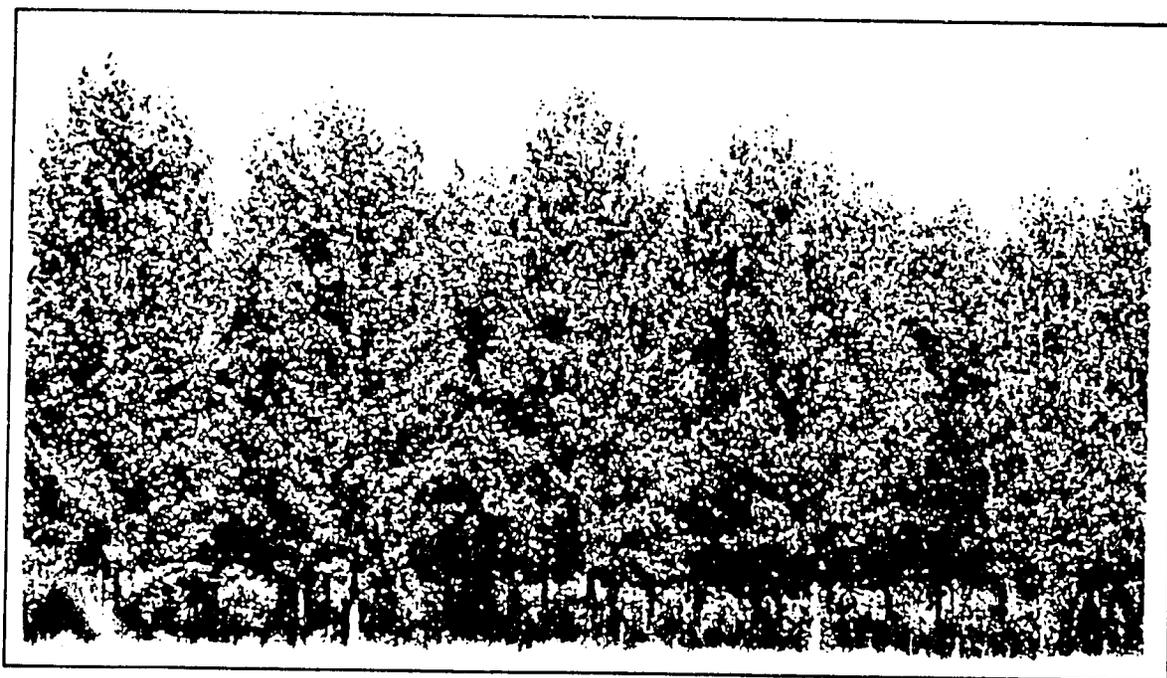
# INSECTS AND DISEASES OF POPLARS

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Like every other plant, poplars are also susceptible to many diseases and damages by bacteria, fungi insects and wild animals. Its stem, leaves, branches and roots are affected by one disease or the other. In different parts of Pakistan poplars also have to survive southern climates, windstorms, sun-scorch, hailstorms, waterlogging, weeds and fires. However, most of the damage is caused by insects. Nevertheless the attacks have been sporadic and have not attained dangerous proportions so far.



A 3-year old healthy poplar plantation.

It must be emphasized that proper irrigation, hoeing, and timely pruning of poplars keep them in a good hygienic and vigorous condition, thereby minimizing the attack of insects and fungi. If the required cultural operations and water are denied poplars, the insects may attack the tree immediately finding it weak and poor in growth. It has been observed in Pakistan that poplars are first of all damaged through lack of provision of its minimum requirements

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of water and nutrients and it is at that stage that the pests make their appearance. In intensively managed poplar plantations hardly any insects or fungal attacks have been observed. Timely restocking and avoiding physical damage by live-stock and mechanical equipment is also a must.

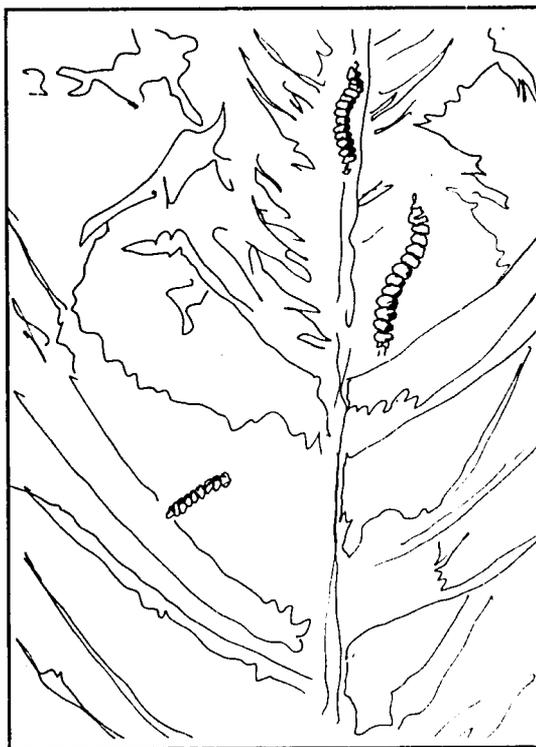
### INSECTS:

Several insects were found attacking poplar nurseries and plantations in Pakistan. Most serious amongst them were either defoliators or borers. Defoliators adversely affect the growth and borers kill the tree when the attack is severe. The remaining pests have not assumed the form of an epidemic and are not, thus, of any significance from a practical view point. A description of the important species together with their control is given in this technical note.

### DEFOLIATORS:

#### Ichthyura anastomosis Steph (Notodontidae - Lepidoptera):

**Description:** A dull colored, brownish, hairy caterpillar. It feeds on the foliage, first in groups and separately when it is older. It mostly occurs in NWFP and the Punjab and sometimes appears in the epidemic form. The pest has 6 to 7 generations a year. Hibernation occurs in winter as larvae and pupae. It again becomes active in February/March.

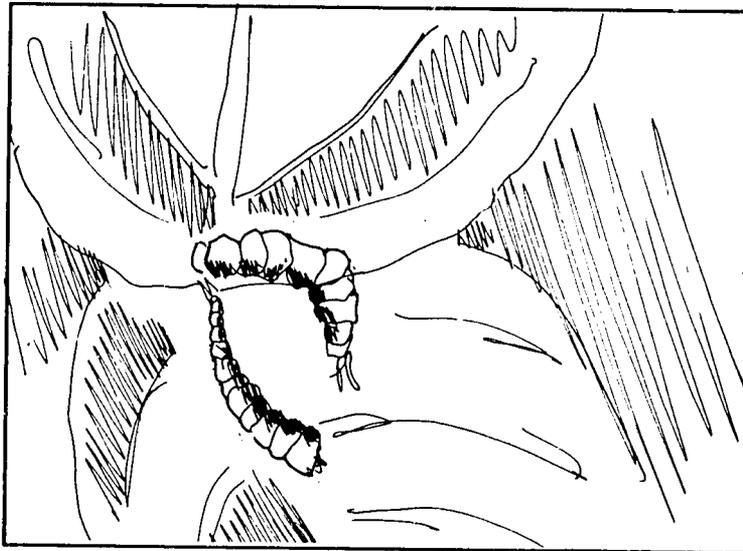


Larvae of Ichthyura anastomosis feeding on poplar leaves.

**Control:** Spray Sevin (85% Sprayable Powder, S.P.), Dipel or Bactospeine at the rate of 1 kg per hectare, or Dimilin (25% wetable Powder, W.P.) at the rate of 400 gr. in 100 liters of water per hectare.

**Gypsonoma hapalosarca Meyr (Tortricidae - Lepidoptera):**

**Description:** A black caterpillar initially, turning grey. It is a leaf sticher feeding in-between two stitched leaves thereby skeletonizing part or whole leaves, giving a dried look to the trees. Larvae pupate in silken cocoons among stitched leaves and there are 6 to 7 generations in a year. Maximum population and leaf damage is seen in August. Hibernation occurs in leaves which fall to the ground in winter and moths emerge in the second half of March.



Larvae of leaf sticher Gypsonoma hapalosarca feeding between two leaves of poplar.

**Control:** Burn plant debris in winter to kill hibernating pest population. Spray insecticides having penetrative action such as, Ekalux, Laser, etc. Spray Dimecron on leaves.

**Plagioderia versicolora Laich (Chrysomelidae - Coleopetra):**

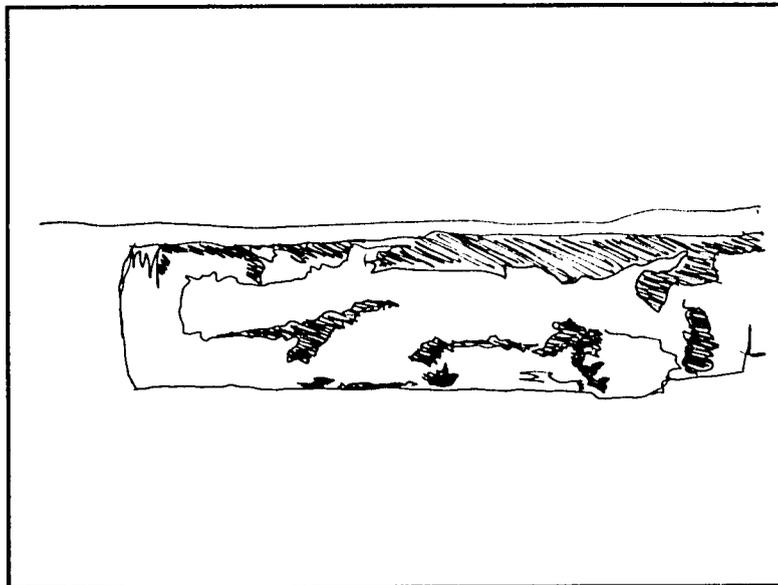
**Description:** A brilliant bluish green and black grub. It mostly feeds on foliage of poplars and willow in nurseries. The pest has several generations a year. Beetles over-winter in various shelters and leaves. Grubs skeletonize leaves feeding on both surfaces but mainly on the lower surface. Pupa is attached to leaf.

**Control:** Spray Sevin(85% S.P.) or Dimilin(25% W.P.) on leaves at the rate of 1 Kg per hectare.

## BORERS:

### Melanophila picta Pall (Buprestidae - Coleoptera):

**Description:** A flat-headed bark borer. It enters sapwood for pupation and causes heavy growth losses occasionally killing the trees. It is very serious in arid zones and in water deficient conditions in other areas. Beetles appear in May to July after pupation for 3 months. Fresh attack appears June - July and larval feeding lasts for 8-10 months. Life cycle is annual.

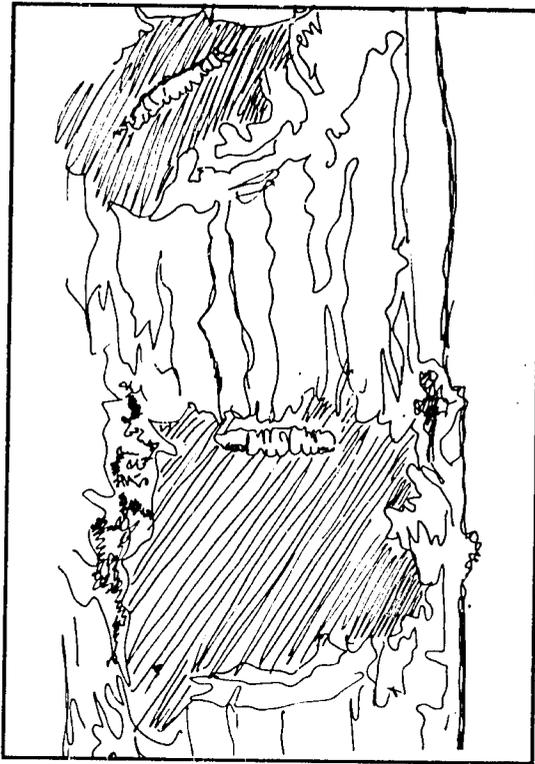


Damage caused to the poplar stem by Melanophila picta.

**Control:** Poplars should not be grown in weak soils and water deficient areas. Grubs can be killed by applying 30 to 100 grams of Temik, Furadon or any other granules per plant in early stages of attack.

### Aeolesthes sarta Solsky (Cerambycidae - Coleoptera):

**Description:** A stem borer of serious nature. It is found in dry areas of Gilgit, NWFP, Balochistan and some parts of Punjab. The galleries run under the bark in sapwood making big holes and large galleries ultimately causing tree mortality. Grubs feed for 17 to 18 months and pupate for 3 to 4 months. Beetles appear in March to May after a two years life cycle.



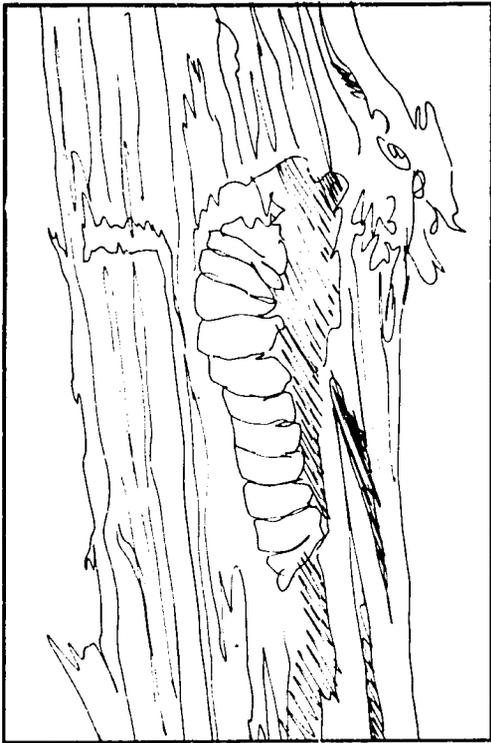
Grub of Aeolesthes sarta stem borer with gullies.

**Control:** Preventive spraying with BHC at the time of emergence of beetles in March/April. Inject 0.1% BHC in freshly made holes in April and May.

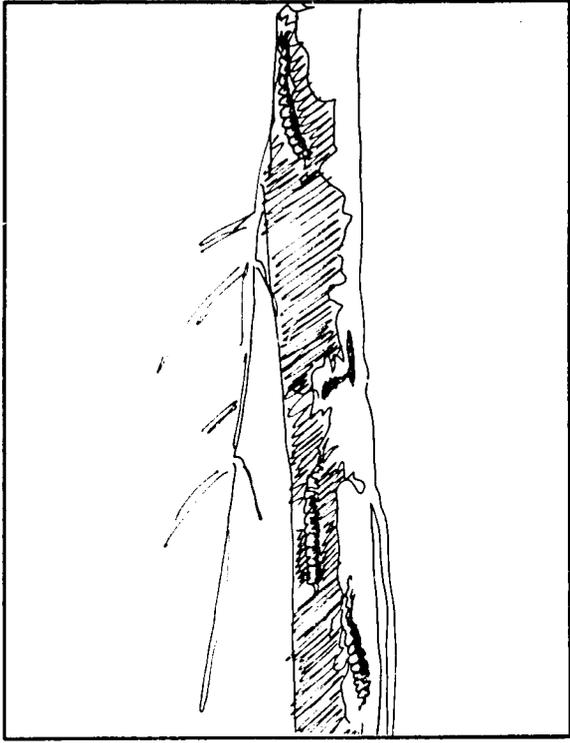
**Apriona cinerea Chev. (Lamiidae - Coleoptera):**

**Description:** A pith borer of poplars. It is mostly found in NWFP, Azad Kashmir and Punjab. The eggs are laid in eyeshaped slits made in the young branches by grey long-horn beetles. Larvae on hatching bore downward tunnels in branches and stem, also reaching roots of small plants. Ejection holes are made at intervals, which indicate the path of the borer. Life-cycle is completed in two years.

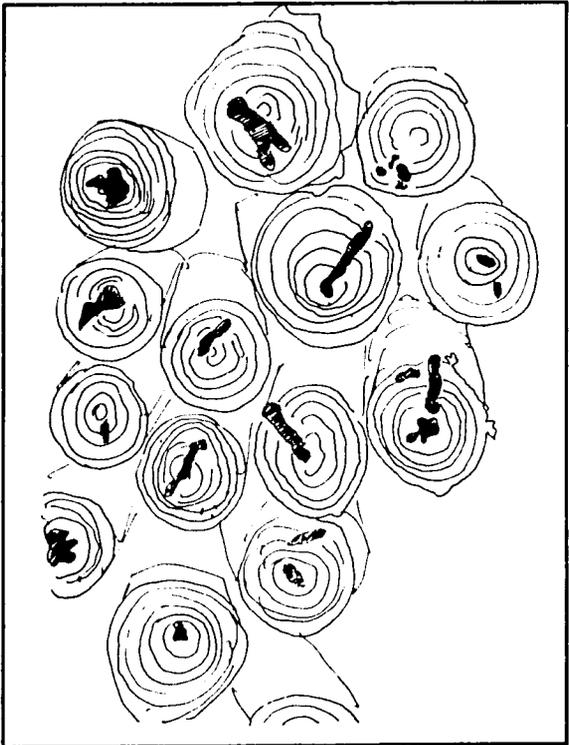
**Control:** Plug the last hole and inject any insecticide or kerosene oil in the second to last hole.



Full grown grub of Apriona cineræ preparing pupal chambers.



Ejection holes made by Apriona. Frass is coming out of the holes.



Poplar logs showing damage caused by Apriona, holes and ejection holes leading to the sides.

**Indarbela quadrinotata Walk (Indarbelidae - Lepidoptera):**

**Description:** A crimson red to brownish larvae. It make burrows for living in the stem and branches and feeds superficially on the surface of bark under a cover made of silken threads, bits of bark and excrement, visible from a distance. Full grown larvae measure 3.5 to 5 cm in length. Pupation occurs in a shelter burrow. Heavy attack weakens the tree but seldom kills it. It feeds on many trees besides poplars. The life cycle is annual.

**Control:** Spraying of trees with BHC at the end of May to prevent egg laying. Removal of loose web-like cover and spraying the stem will kill the larvae.

**DISEASES:**

**Leaf blister caused by Taphrina populina Fr. (T.aurea Fr.):**

**Description:** T. populina is an ascomycete that causes large, conspicuous blisters on Populus ciliata leaves. The blisters first appear in May and June as convex rounded or irregular projections, sometimes on both sides of the leaf but more often on the upper side only. The upper side of the blister remains green like the rest of the leaf surface but the concave underside soon becomes lined by a bright golden-yellow layer of asci. The fungus over winters as spores on the bud scales and in damp weather attacks the young shoots when the buds burst in spring. The disease is very common and striking and causes premature leaf fall.

**Control:** Plant sanitation measures and spraying with Bordeaux mixture and other copper fungicides are suggested.

**Poplar leaf rusts (Melampsora spp.):**

**Description:** M. allii-populina, M. larici-populina and M. populnea are heteroecious-needng two hosts to complete their life cycles. The principal hosts are P.alba and P.ciliata. Uredosori and teleutosori are produced on poplars and their spermogonia and aecidia are produced on various alternate hosts. They occur in both nursery and plantations and are more important in the former than in the later. The uredosori and teleutosori appear on the underside of the leaves. The uredosori are about 1 mm across, round and bright orange in color, with oblong or broadly club-shaped uredosopires. The dark brown teleutospores which form under the epidermis are about the same size as the uredosori and are made up of groups of column-shaped teleutospores.

**Control:** Spray with a Bordeaux mixture. Other copper sprays control Melampsora spp. and zineb has also given good results.

**Cytospora dieback and bark necrosis caused by Valsa sordida Nits. (Stat.conid. Cytospora chrysosperma Fr.):**

**Description:** C. chrysosperma is a weak wound parasite that causes dieback and necrosis in Populus nigra growing in the Northern Areas. It attacks mostly nursery plants and young trees. The fungus enters the host through wounds. It is common on the bark even on healthy trees and is always there to enter if conditions favor it.

The fungus grows in the bark of twigs, branches and stems and its pycnidial stage which may be found from May to September, erupts as scattered grayish-black stromata about 2 mm across. Masses of sausage-shaped conidia are found in the cavities in the stromata and in damp weather emerge with numerous large, yellow or golden tendrils. The perithecia when formed are also embedded in the stromata; they are black and flash-shaped. These occur in autumn. The fungus grows readily in culture and resists temperature well below freezing.

Within the plant, the fungus grows in the bark, kills the cambium, and enters the wood. Small twigs and branches may be girdled and dieback. On large branches and stems sunken lesions are produced and on these scattered stromata are produced. The factors affecting the disease are moisture stress, temperature, the quality of the site and resulting vigor of the tree and closeness of plantings.

**Control:** To prevent Cytospora dieback and bark necrosis care should be taken to provide good growing conditions in nurseries with sufficient water and nutrients. Damage to the plant particularly in winter should be avoided and so should overcrowding. Cuttings stored in winter should be kept at 2°C to avoid infection. Trunk injections with ferric sulphate and spraying with 1% Bordeaux or Burgundy mixture have shown promising results.

**Virus disease (Vein clearing):**

**Description:** In poplars the virus causes vein clearing and spotting so that different light green or yellowish spots appear scattered over the leaves. Symptoms vary somewhat with the species or clone of poplar, and in some clones necrotic spots may be found on leaf and petioles. In severe infections, leaf curling may occur and swellings appear on twigs. Infection may lead to premature leaf fall and reduction in growth may also result. The virus spreads mainly by the use of diseased cuttings. The hosts include P. euramericana clones.

**Control:** The disease can be controlled only by the destruction of diseased propagating stools to prevent the dissemination of diseased planting stock.

**Watermark disease caused by Erwinia salicis(Day) Chester(Bacterium salicis(Day), Pseudomonas Saliciperda Lindeijer):**

**Description:** Watermark, a bacterial disease, is particularly important and destructive to hybrid poplars in irrigated areas. It causes stain and degrade in the poplar wood. The wood of trees affected by the disease is rendered unsalable for industry because it is badly discolored and also affects the strength of the wood. External symptoms first appear in late April or early May when a thin sticky liquid containing bacteria exudes from insect exit holes and other wounds on affected twigs. Further wilting in leaves and dieback may continue through the summer, though only part of the crown is affected in a year and throughout the season fresh green shoots may also be attacked. The diseased trees rarely die but soon become stag-headed.

Internally the wood of infected trees shows a watermark stain. This may form complete or interrupted rings, or spread widely through the wood. On exposure to the air it turns bright red and then slightly black. Sometimes in recently attacked trees the staining is confined to a few shoots with withered leaves. In other case it occurs almost throughout reaching as far as the roots. At times, however, when staining is extensive inside the tree, only a few shoots may show dieback and leaf wilting and the severity of the external symptoms may be a poor indication of that of the deterioration within. Once inside the tree, the bacteria persist from one year to another and commonly spread outwards from one annual ring to the next. The disease tends to spread in the direction of prevailing wind. Insects act as vector for the disease. The bacteria gain entry through wounds in the branches and through the exit holes made in the bark by saw flies.

Field observations support the view that watermark disease spreads from susceptible poplar clones. Spread may also take place from the stumps of felled infected trees. Field evidence also suggests that the disease may be distributed with the sets/cuttings used in propagation.

**Control:** The disease is controlled by careful examination and roguing of propagation buds to prevent the distribution of infected sets and by the felling and destruction of infected trees. The stumps of the felled trees should be killed by the use of a suitable herbicide.

**Leafy mistletoe (Viscum album):**

**Description:** Leafy mistletoe, member of Loranthaceae, parasitises Populus nigra, P.ciliata and P.alba growing in the temperate forests of Pakistan. The mistletoe plants are evergreen perennials and can be seen more easily in winter on the hosts. They are 2 to 2½ ft. high growing on the stems of their hosts and send sinkers (roots) into the interior of branches and stem to absorb nutrients.

**Control:** 2, 4-D effectively controls the parasite.